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Higgins

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(54) **MASONRY VENEER MACHINE**

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(72) Inventor: **Joshua Higgins**, Orange, CA (US)

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B28D 7/04 (2006.01)
B24B 49/00 (2012.01)

(52) **U.S. Cl.**
CPC . ***B28D 7/04*** (2013.01); ***B24B 49/00*** (2013.01); ***B28D 1/04*** (2013.01); ***B28D 1/048*** (2013.01)

(58) **Field of Classification Search**
CPC B24B 49/00; B24B 9/06; B24B 9/102; B28D 1/04; B28D 1/045; B28D 1/047; B28D 7/04
USPC 451/5, 184, 336; 125/13.01, 14, 35
See application file for complete search history.

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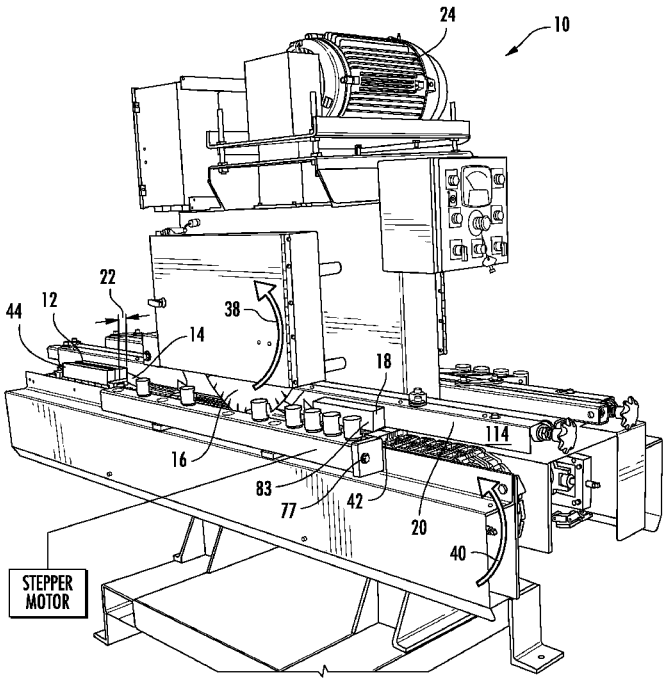
(57) **ABSTRACT**

A masonry veneer machine is disclosed having adjustable fingers for applying the proper amount of pressure to the brick against a guide. The adjustable fingers are disposed on the lateral side of the saw blade, whereas, the guide is disposed on an arbor side of the saw blade. This provides for quick adjustments to the fingers and guide when changing over from cutting bricks of a first size to bricks of a second size which are significantly different from each other.

14 Claims, 10 Drawing Sheets



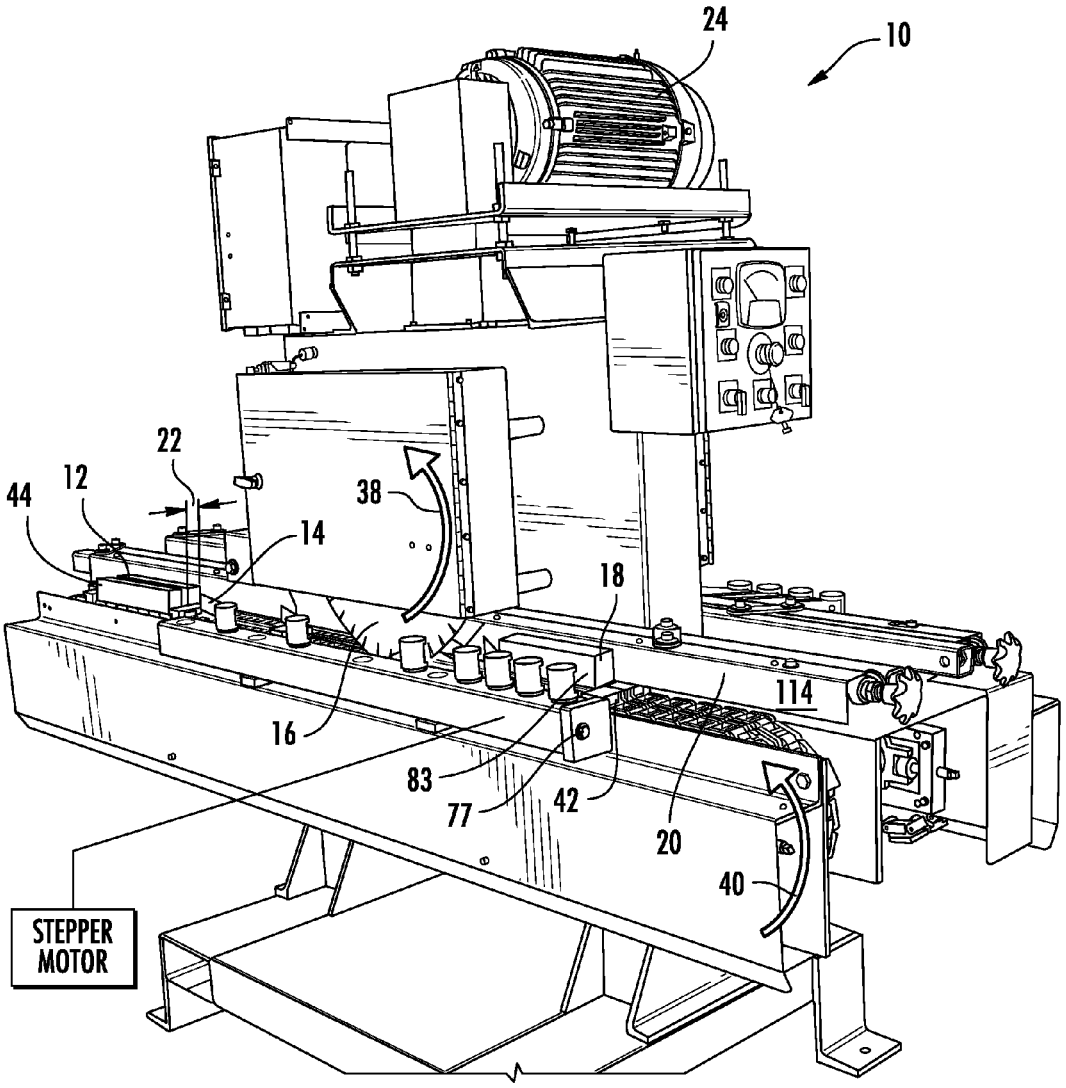


FIG. 1

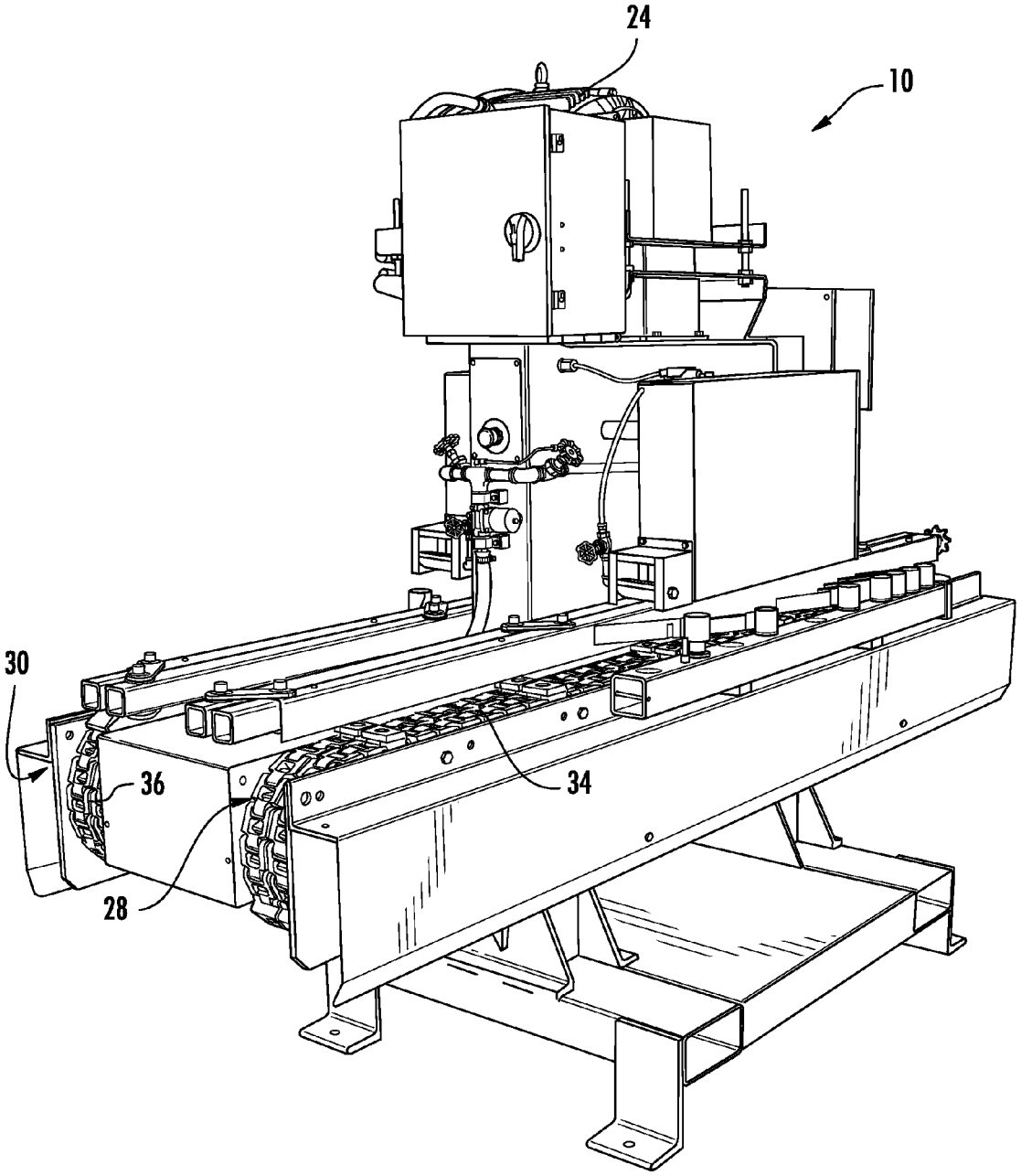
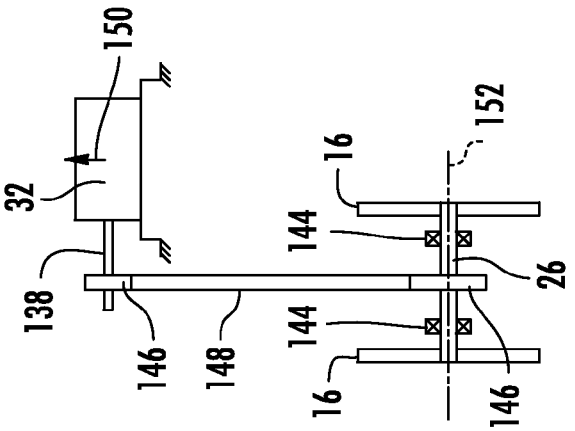


FIG. 2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32
138
146
148
144
144
16
16
152
26
146

FIG. 3A

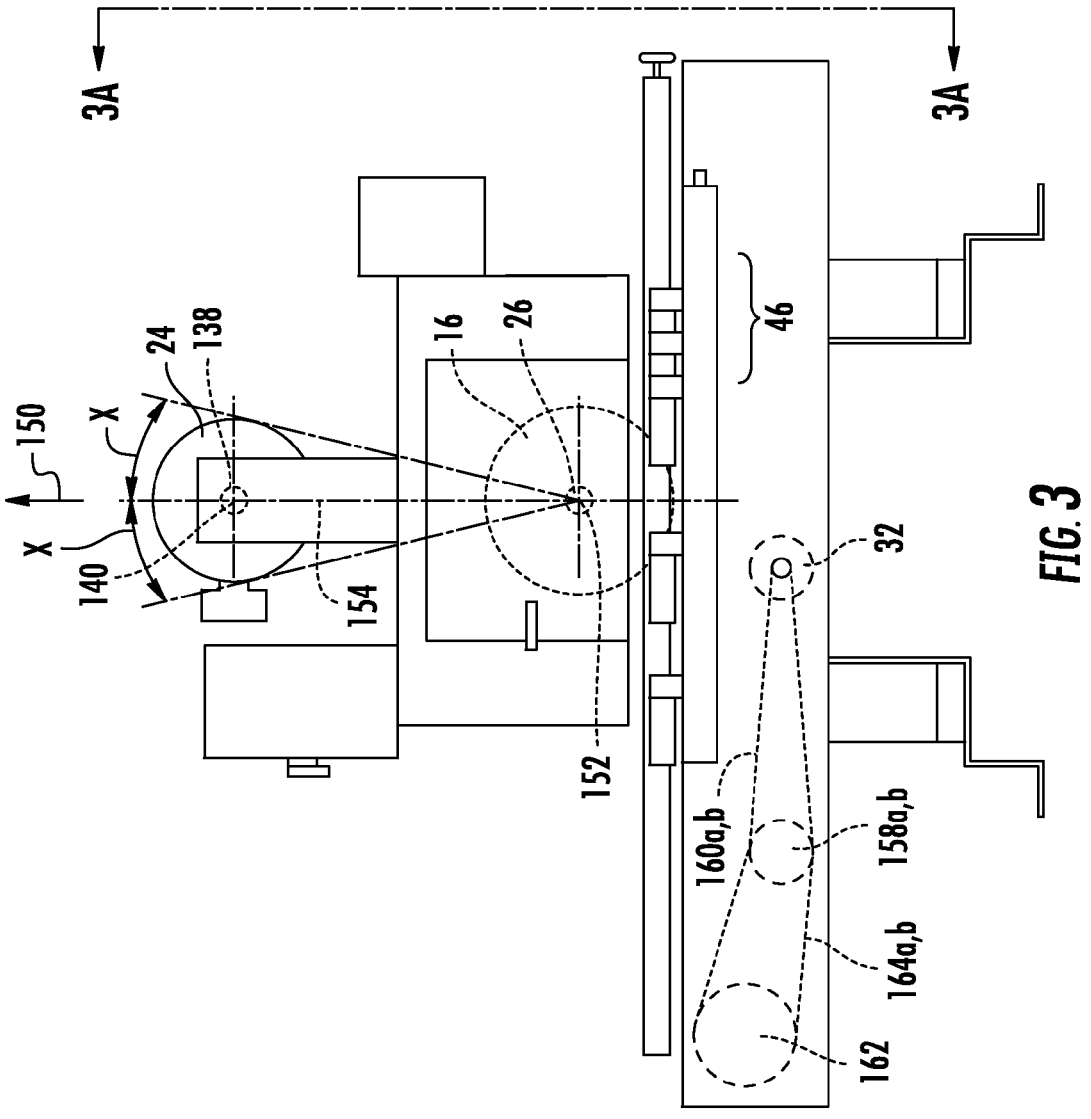

3A
3A
150
X
X
140
24
138
154
16
26
152
46
32
160a,b
158a,b
164a,b
162

FIG. 3

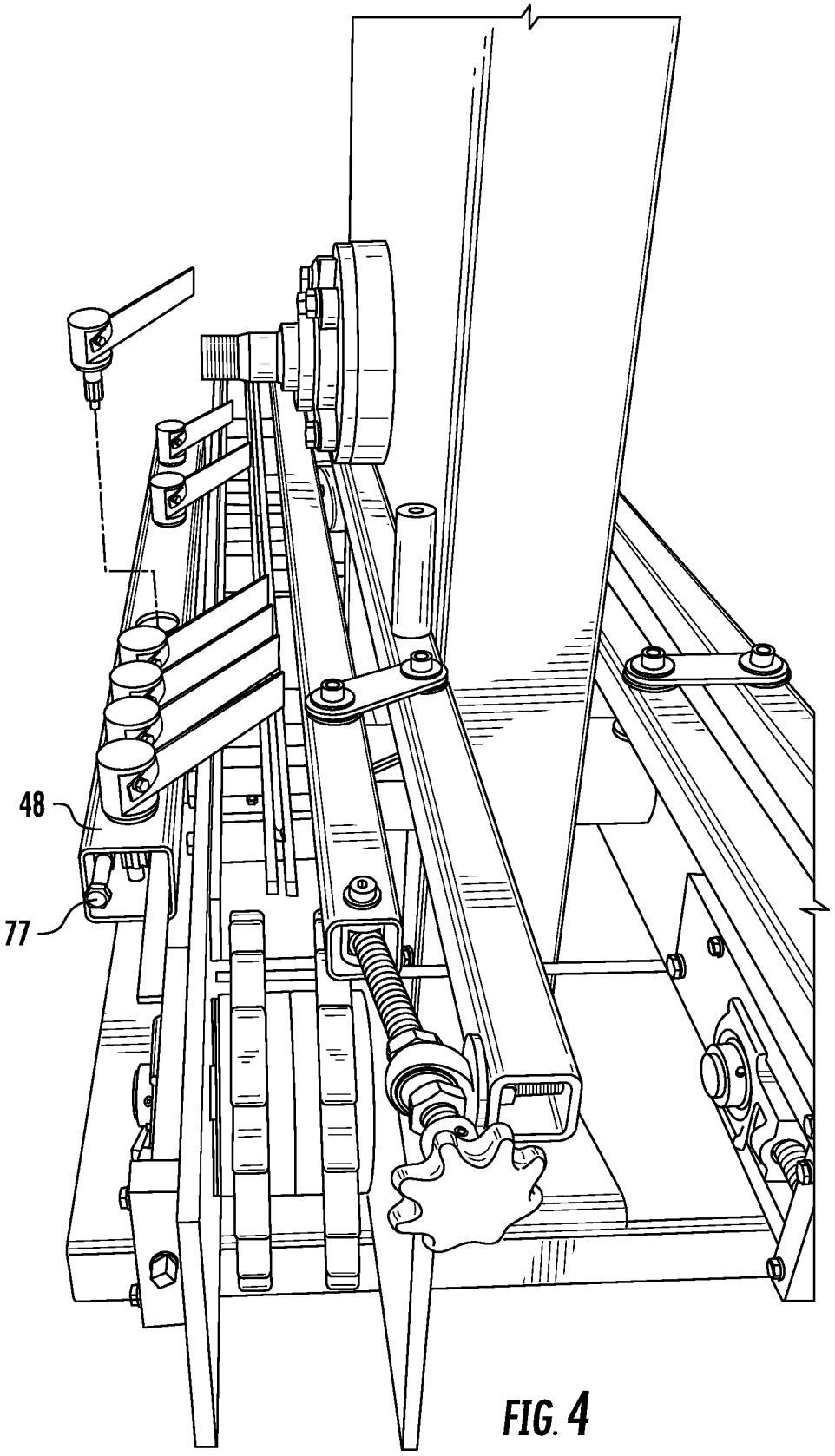


FIG. 4

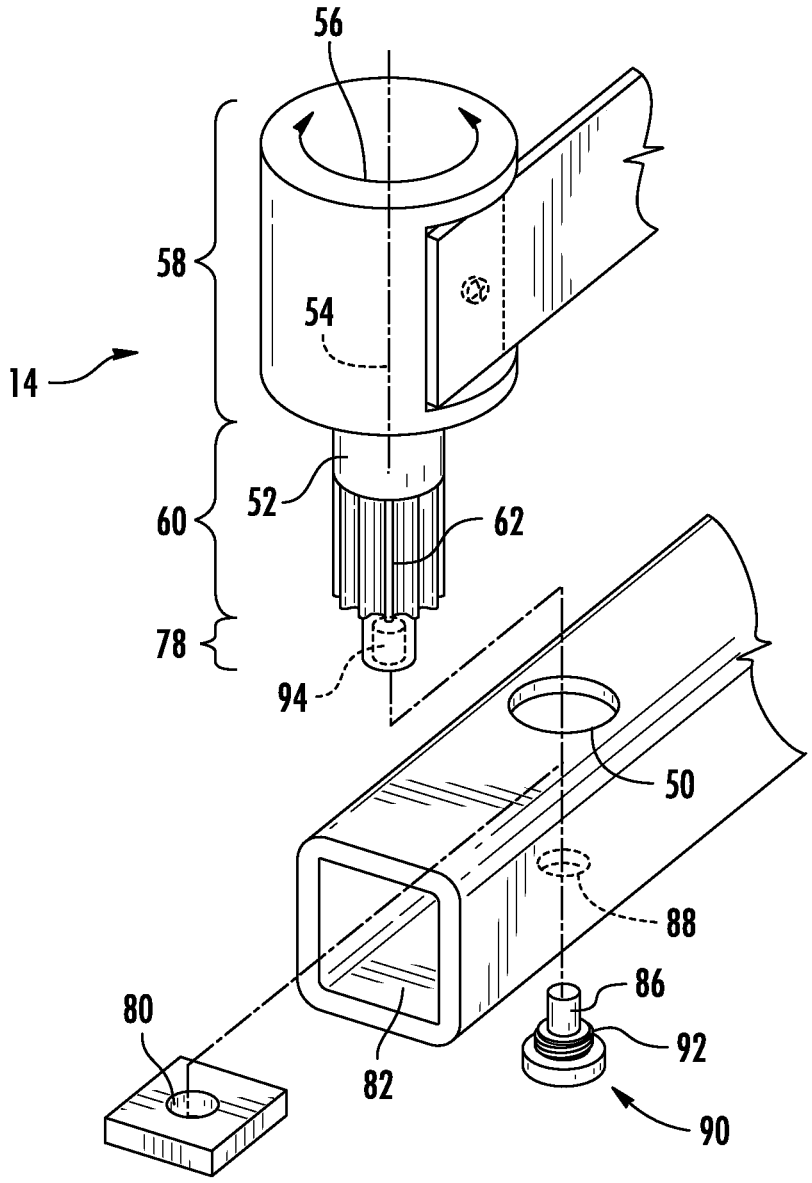


FIG. 4A

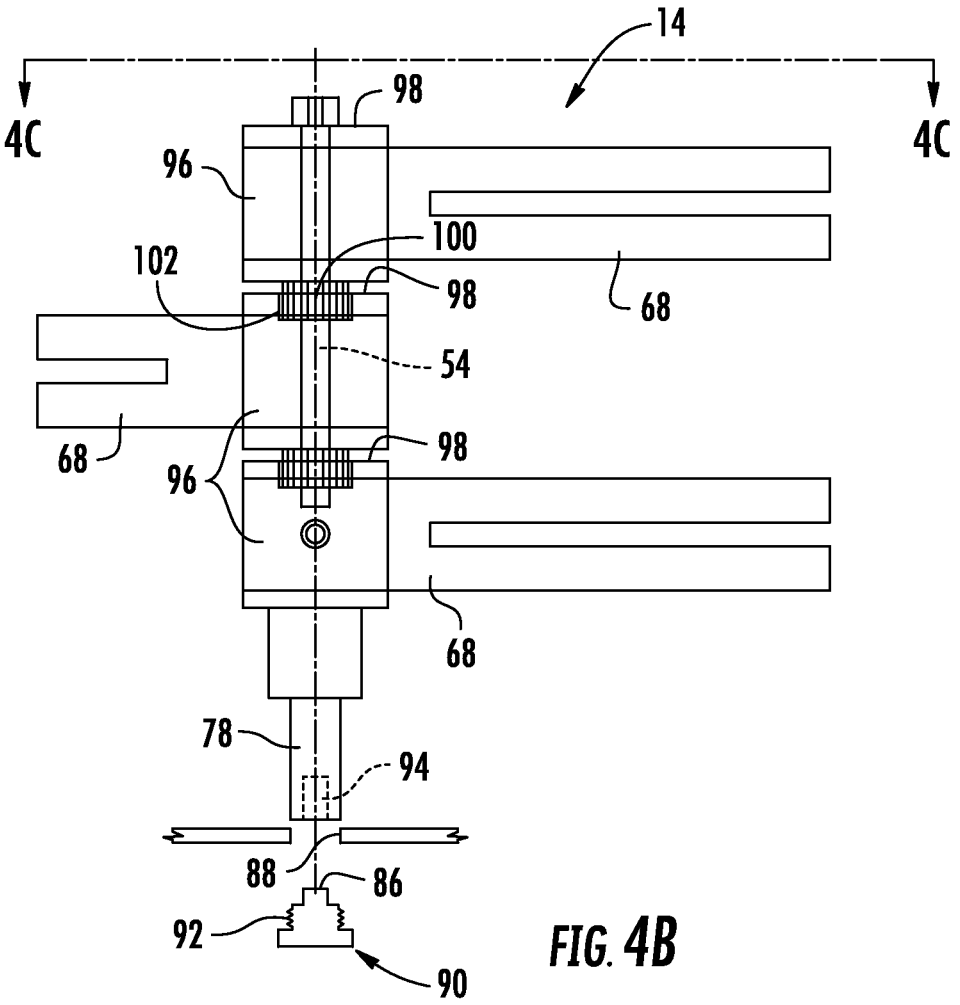


FIG. 4B

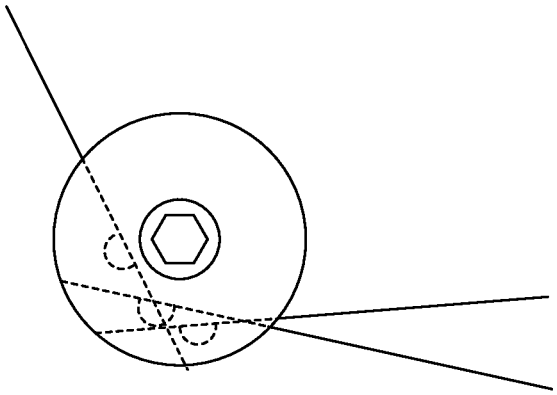


FIG. 4C

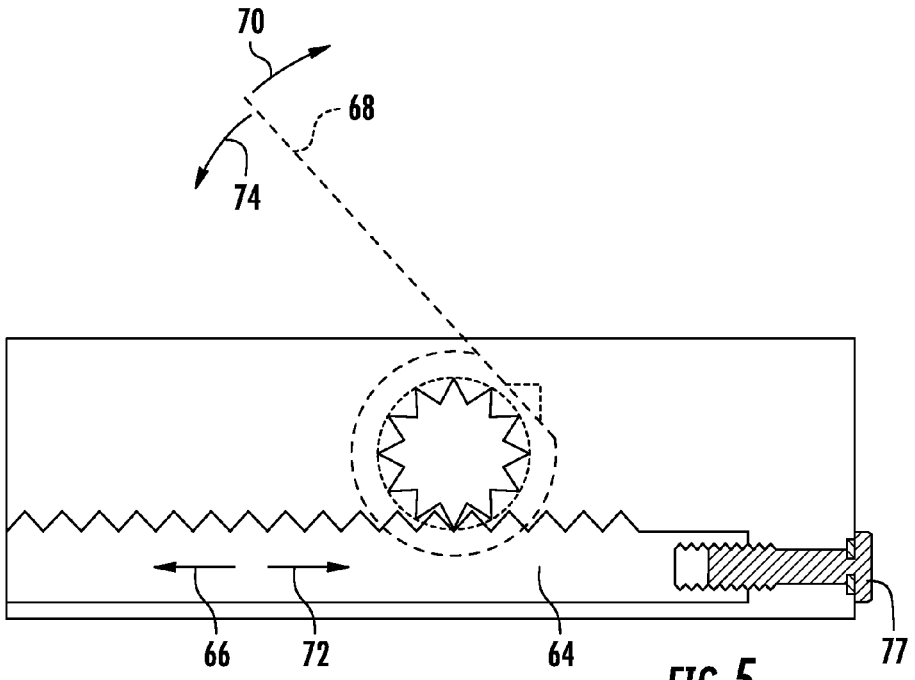
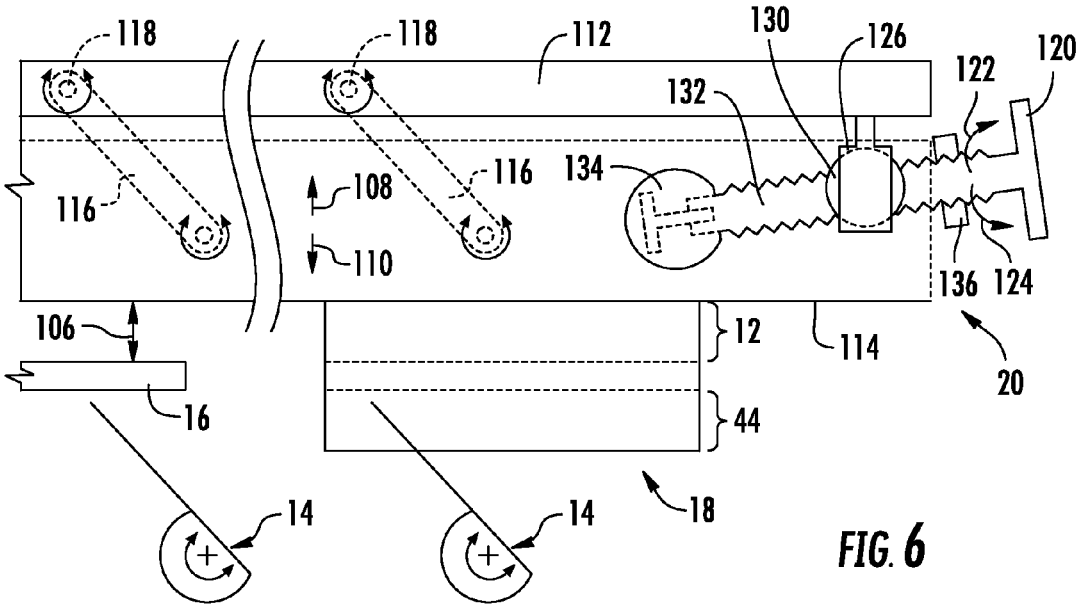

70
68
74
66
72
64
77

FIG. 5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126
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106
12
114
20
16
44
14
14
18

FIG. 6

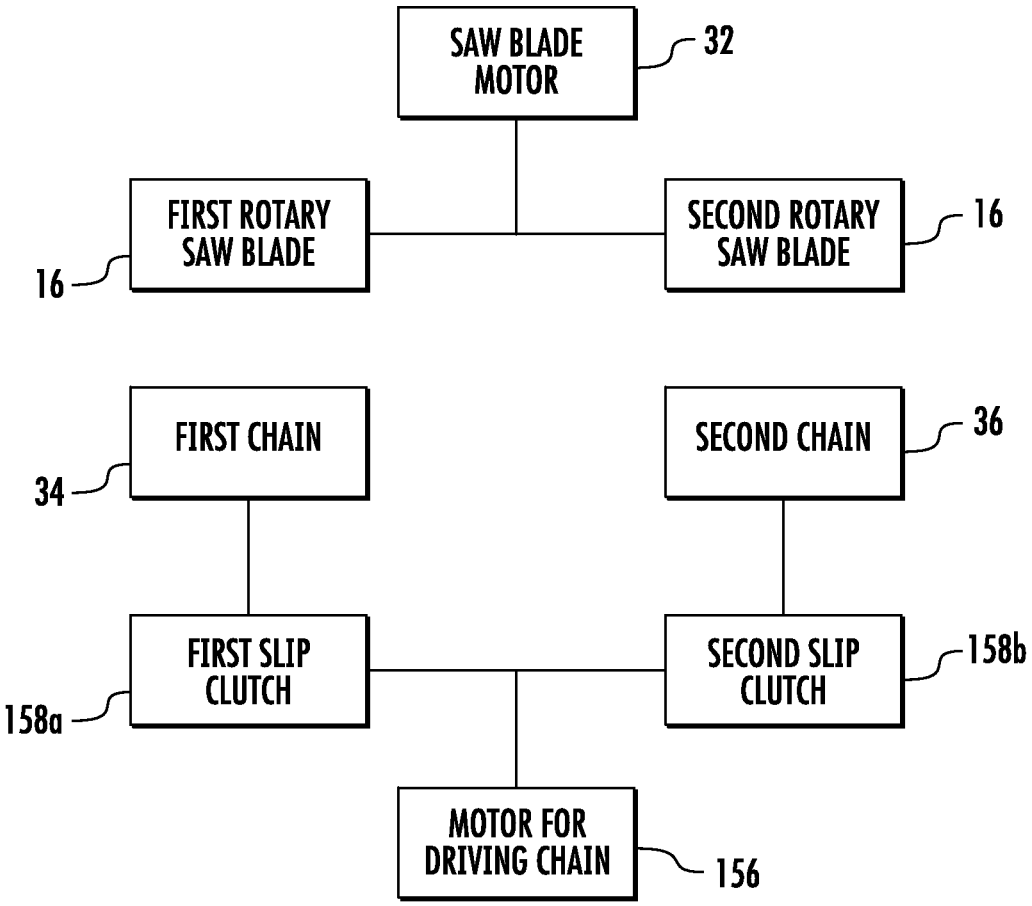
SAW BLADE MOTOR
32
FIRST ROTARY SAW BLADE
16
SECOND ROTARY SAW BLADE
16
FIRST CHAIN
34
SECOND CHAIN
36
FIRST SLIP CLUTCH
158a
SECOND SLIP CLUTCH
158b
MOTOR FOR DRIVING CHAIN
156

FIG. 7

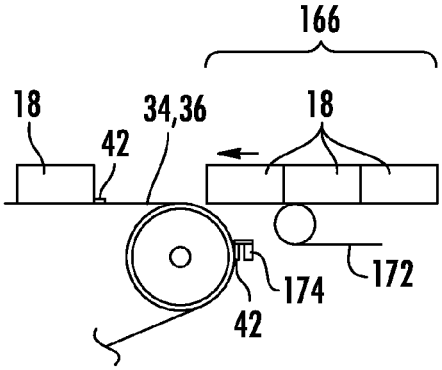

FIG. 8

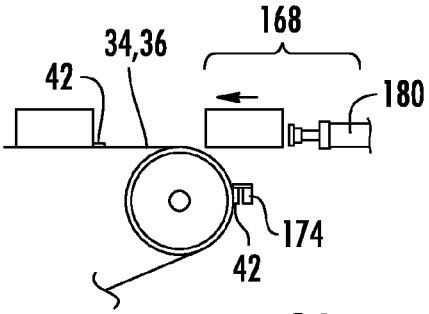

FIG. 9A

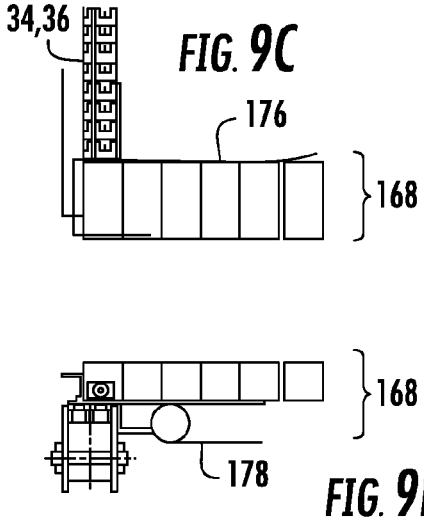

FIG. 9B

FIG. 9C

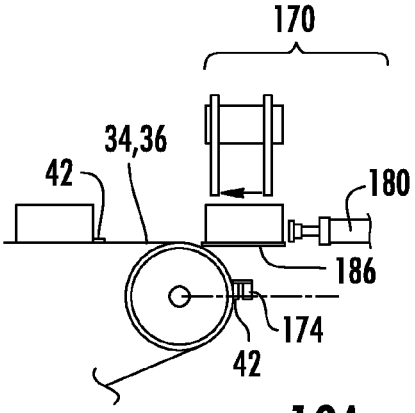

FIG. 10A

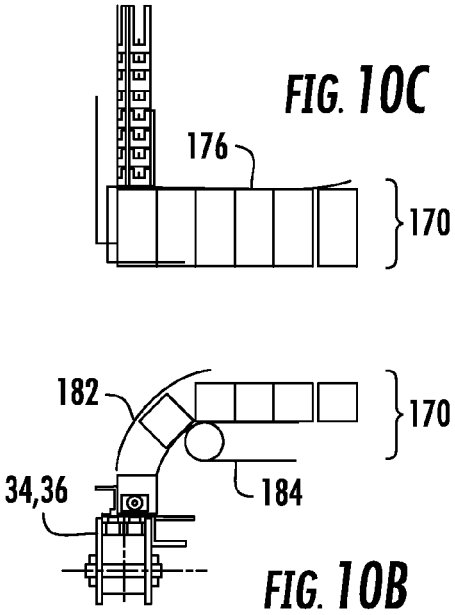

FIG. 10B

FIG. 10C

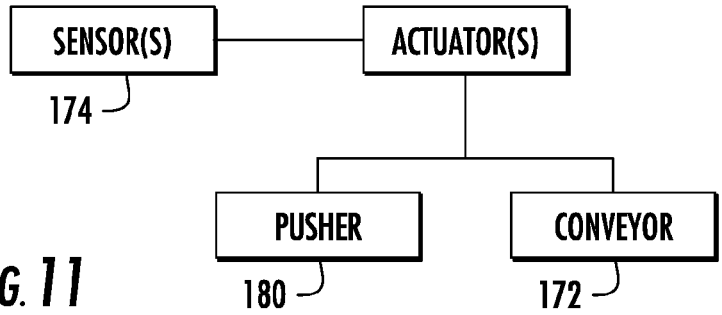

FIG. 11

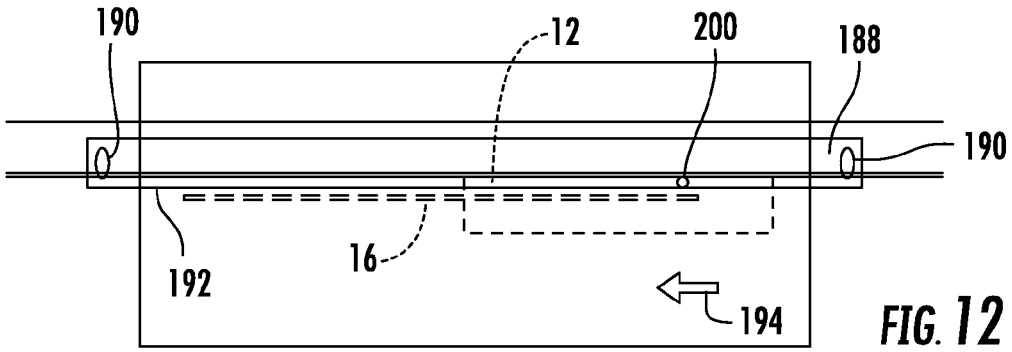

FIG. 12

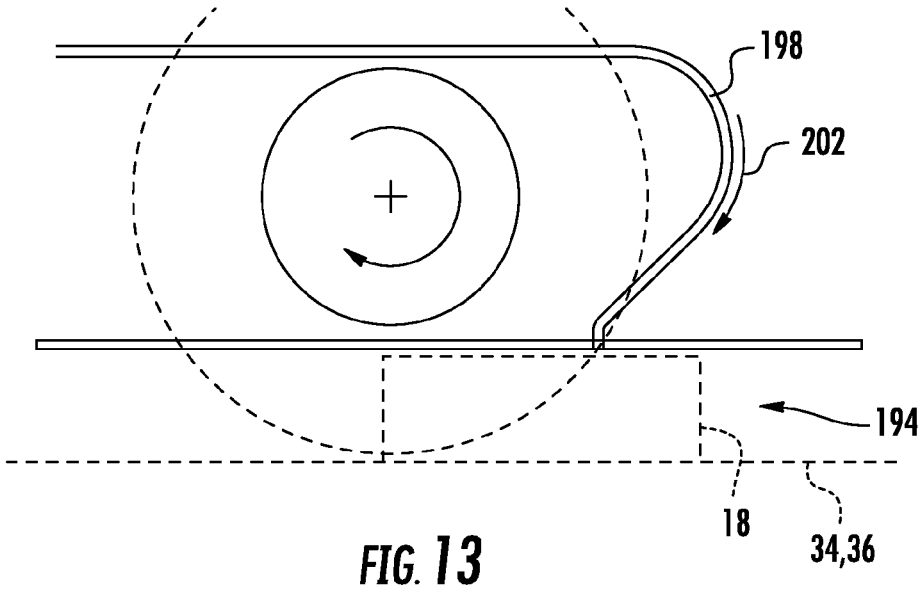

FIG. 13

MASONRY VENEER MACHINE

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

STATEMENT RE: FEDERALLY SPONSORED RESEARCH/DEVELOPMENT

Not Applicable

BACKGROUND

The various embodiments and aspects disclosed herein relate to a masonry veneer machine.

To fabricate a wall having a brick veneer, a plurality of brick tiles must be fabricated. The brick tiles are not full width bricks but are about a ½ inch thick. The brick tiles are cemented onto the wall. The brick tiles are cemented onto the wall. The brick tiles are cut from a normal sized brick with a saw blade. For example, an industrial sized chop saw may be used to cut one brick at a time. As such, the process for fabricating the plurality of brick veneer tiles is time-consuming and often dangerous.

Accordingly, there is a need in the art for an improved method and device for cutting bricks to fabricate a brick veneer tile.

BRIEF SUMMARY

The various embodiments and aspects disclosed herein address the needs discussed above, discussed below and those that are known in the art.

A masonry veneer machine is disclosed which provides for a safe and efficient means for reducing bricks of different widths to have a narrow width for fabricating a brick veneer tile. The machine may have two lines each of which processes the bricks separate and apart from each other. Each of the lines has a saw blade which are driven by a common motor. The motor is positioned vertically above a spindle to which the saw blades are attached to more efficiently transfer energy from the motor to the saw blade. Additionally, each of the lines has an adjustable finger assembly so that the proper amount of force may be applied to each brick being passed through the line. The adjustable finger assemblies are disposed on lateral sides of the saw blade. Also, each of the lines may have an adjustable guide to adjust the width of the brick veneer tile. The adjustable guides are disposed on an arbor side of the saw blade. Each of the lines also has a conveyor driven by a common motor. The motor drives the first slip clutch which in turn drives the conveyor of one of the lines. The motor also drives a second slip clutch which in turn drives the other line. If the brick is jammed in one of the lines, then the respective slip clutch prevents transfer of motion to the conveyor where the jam is located. This allows the other conveyor to continue to operate so that the un-jammed line may be properly cleared and the machine shutdown to clear the jam.

More particularly, a machine for fabricating brick veneer tiles is disclosed. The machine may comprise a conveyor, a saw blade, a guide and a set of adjustable push fingers. The conveyor moves a brick from a loading section through a saw blade section to cut the brick to an unloading section. The saw blade may be disposed above the conveyor at the saw blade section. The guide may be disposed on an arbor side of the saw blade. The set of adjustable push fingers may be disposed opposite the guide with respect to the saw blade for pushing the brick toward the arbor side and against the guide during operation of the machine.

Each of the adjustable push fingers may have a pinion gear. The machine may further comprise a rack traversable in a direction of movement of the conveyor. The rack may be engaged to the pinion gears of the adjustable push fingers for rotating the adjustable push fingers by traversing the rack forward or rearward and adjusting pressure that the adjustable push fingers apply to the brick by incrementally traversing the rack forward or rearward.

Each of the adjustable push fingers can be lifted out of engagement with the rack and rotationally repositioned to increase or decrease the pressure such adjustable push finger applies to the brick. The machine may further comprise a sensor disposed upstream of the saw blade for sensing a position of a lateral side of the brick. The sensor may be operative to send a signal to a stepper motor for incrementally traversing the rack forward or rearward to adjust tension of the adjustable push finger for the upcoming brick to be cut by the saw blade.

The machine may further comprise an auto feeder system having a sensor for sensing a position of the conveyor and an actuator for advancing the brick from the auto feeder system onto the conveyor. The sensor may be a mechanical sensor for sensing a cleat of the conveyor. The actuator may be a conveyor or solenoid.

The guide may be rotatable closer to or further away from the saw blade for adjusting a thickness of the veneer tiles.

In another aspect, a machine for fabricating brick veneer tiles is disclosed. The machine may comprise first and second conveyors, first and second saw blades, first and second guides, first and second sets of adjustable push fingers, a saw blade motor and a belt. The first and second conveyors moves bricks from loading sections through saw blade sections to cut the bricks to unloading sections. The first and second saw blades may be respectively disposed above the first and second conveyors at the saw blade sections. The first and second guides may be disposed on an arbor side of the first and second saw blades. The first and second sets of adjustable push fingers may be disposed opposite the respective first and second guides with respect to the first and second saw blades for pushing the bricks toward the arbor side and against the guides during operation of the machine. The saw blade motor may be vertically aligned to the arbor. The belt may be attached to the arbor and the blade for transferring motion from the motor to the arbor.

An output shaft of the saw blade motor may be disposed directly above the arbor.

The machine may further comprise a conveyor motor. The machine may further comprise first and second slip clutches respectively attached to the conveyor motor and the first and second conveyors so that the first and second conveyors continue to run even if the other conveyor is jammed.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the various embodiments disclosed herein will be better understood with respect to the following description and drawings, in which like numbers refer to like parts throughout, and in which:

FIG. **1** is a front perspective view of a masonry veneer machine;

FIG. **2** is a rear perspective view of the masonry veneer machine shown in FIG. **1**;

FIG. **3** is a side view of the masonry veneer machine shown in FIG. **1**;

FIG. **4** is a partial disassembled view of the masonry veneer machine shown in FIG. **1** illustrating fingers and a guide;

FIG. **4**A is an exploded perspective view of the finger and a finger mounting fixture;

FIG. **4**B is an alternate finger assembly for providing for a taller finger;

FIG. **4**C is a top view of the finger assembly shown in FIG. **4**B;

FIG. **5** is a cross-sectional view of the finger and the finger mounting fixture shown in FIG. **4**A illustrating a rack and pinion connection for adjusting an angular orientation of the tines of the fingers;

FIG. **6** is a top cross-sectional view of the guide illustrating adjustability of the guide to a saw blade;

FIG. **7** is a schematic view of the motors and the saw blades and conveyors of the masonry veneer machine;

FIG. **8** illustrates a first embodiment of a brick loading system for the masonry veneer machine;

FIG. **9**A is a side view of a second embodiment of the brick loading system for the masonry veneer machine;

FIG. **9**B is a rear view of the second embodiment of the brick loading system shown in FIG. **9**A;

FIG. **9**C is a top view of the second embodiment of the brick loading system shown in FIG. **9**A;

FIG. **10**A is a side view of a third embodiment of the brick loading system for the masonry veneer machine;

FIG. **10**B is a rear view of the third embodiment of the brick loading system shown in FIG. **10**A;

FIG. **10**C is a top view of the third embodiment of the brick loading system shown in FIG. **10**A;

FIG. **11** is a schematic view of a feedback sensor for synchronizing the brick loading system to the masonry veneer machine;

FIG. **12** is a top view of a blade of the masonry veneer machine with a liquid lubrication system; and

FIG. **13** is a side view of the blade of the masonry veneer machine and the liquid lubrication system.

DETAILED DESCRIPTION

Referring now to the drawings, a masonry veneer machine **10** is shown. The machine **10** is capable of producing a veneer tile **12** in a safe and efficient manner to provide for high throughput. The machine **10** has a plurality of adjustable pressure applying fingers **14** on lateral sides of saw blades **16**. The fingers **14** press a brick **18** against an adjustable guide **20** which is disposed on a medical or arbor side of the saw blades **16**. The adjustable guide **20** may be traversed closer to or further away from the saw blade **16** to adjust a thickness **22** of the veneer tile **12**. The adjustable fingers **14** and guide **20** allow the machine **10** to accommodate a wider range of brick sizes and also for quicker changeovers, if necessary to cut bricks **18** of a larger or smaller size outside of the current range. Other features are also incorporated into the machine **10** that allow the machine **10** to have a small footprint and a high throughput. By way of example and not limitation, the machine **10** has a motor **24** that is vertically positioned above a spindle **26** of the saw blade **16** to provide for a more efficient transfer of energy from the motor **24** to the spindle **26**. Additionally, the motor **24** drives two saw blades **16** on both sides of the machine **10**. The machine **10** may also be fitted with sensors and actuators for machine loading and on-the-fly adjustments to the fingers **14** to apply the proper amount of pressure to the brick **18** approaching the saw blade **16** and then readjusting the fingers **14** based on the size of the next upcoming brick **18**.

More particularly, referring now to FIGS. **1** and **2**, the machine **10** has two lines **28**, **30**. Each line **28**, **30** has a saw blade **16** that cuts a brick **18** independent of the other line **28**, **30**. Both saw blades **16** are driven by the same motor **24**. Additionally, a motor **32** rotates two conveyors **34**, **36** (one conveyor **34**, **36** for each line **28**, **30**) to traverse a plurality of bricks **18** along each of the lines **28**, **30**. During operation, the motor **24** rotates the saw blades **16** in the direction of arrow **38**, while motor **32** rotates the conveyors **34**, **36** in the direction of arrow **40**. It is also contemplated that the motor **24** may rotate the saw blades **16** in the opposite direction as well. To fabricate a veneer tile **12**, an operator places a brick **18** in front of a cleat **42** attached to the conveyor **34**, **36**. The operator may place one brick **18** in front of each upcoming cleat **42** on each of the lines **28**, **30**. As the conveyors **34**, **36** rotate in the direction of arrow **40**, the cleats **42** push the brick **18** toward the saw blades **60**. The fingers **14** push the brick **18** against the guide **20** before the brick **18** reaches the saw blade **16**. When the brick **18** passes through the saw blade **16**, the brick **18** is rip cut into two pieces, namely, a veneer tile **12** and a leftover portion **44**. If the leftover portion **44** can be recut to produce a second veneer tile **12**, then the leftover portion **44** is placed upstream of the saw blade **16** and in front of an upcoming cleat **42**. The veneer tile **12** is unloaded from the machine **10** typically onto a pallet (not shown).

Referring now to FIG. **3**, a side view of the machine **10** is shown. A plurality of fingers **14** are positioned at an upstream section **46** of the saw blade **16**. The fingers **14** at the upstream section **46** push the brick **18** against the guide **20** to regulate a thickness **22** of the veneer tile **12**. One or two more fingers **14** may be positioned downstream of the saw blade **16** to help maintain the veneer tile **12** and the leftover portion **44** on the conveyors **34**, **36** after being cut by the saw blades **16**.

Referring now to FIGS. **4** and **5**, the fingers **14** may be mounted to an elongate mounting fixture **48**. The fingers **14** may be removably attachable to the elongate mounting fixture **48**. In particular, the elongate mounting fixture **48** may be a square tube. A hole **50** may be formed in the top side of the square tube. The thickness of the tube receives a neck **52** of the finger **14**. The size of the neck **52** is sized and configured to have a snug fit with the inner diameter of the hole **50** but still allow the finger **14** to freely rotate. The fingers **14** are capable of rotating about axis **54** in direction **56**. The fingers **14** can rotate and be set at a particular angular orientation so that tines **68** of the fingers **14** can apply the proper amount of pressure to the brick **18** being traversed through line **28**, **30**. The upper portion **58** of the finger **14** is larger than the neck **52** so that a bottom surface rests on the top side of the tube when the neck **52** is received in the hole **50**. The lower portion **60** includes the neck **52** and a pinion gear **62**. The pinion gear **62** engages a rack **64** that is disposed within the tube. The rack **64** extends along the tube so that all of the pinion gears **62** of the plurality of fingers **14** engage the rack **64**. If the rack **64** is traversed in the direction of arrow **66**, then the tine **68** of the finger **14** is rotated in the direction of arrow **70** to apply more pressure to the brick **18**. Conversely, if the rack **64** is traversed in the direction of arrow **72**, then the tine **68** of the finger **14** is rotated in the direction of arrow **76** to apply less pressure to the brick **18**.

To adjust the pressure that the fingers **14** apply to the brick **18**, the operator can turn a bolt **77**. The bolt is engaged to the rack **64** so that turning the bolt in one direction would pull the rack **64** closer to the bolt and turning the bolt in the opposite direction would push the rack further away from the bolt. By traversing the rack **64** closer to or further away from the bolt **64**, the pinion **62** will rotate which also in turn angularly

positions the tines **68**. Additionally, traversing the rack **64** rotates all of the fingers the same amount.

It is further contemplated that the bolt **77** may be rotated with a stepper motor **81** based on a proximity sensor **79**. In particular, the proximity sensor **79** is positioned to sense an edge or lateral surface **83** of the brick **18** to be cut. The proximity sensor **79** is positioned upstream of the saw blade **16** and within or after the upstream section **46** of the fingers **14** so that the sensor **79** senses the edge or lateral surface **83** of the brick after the brick **18** is pushed against the guide **20**. The sensor **79** senses the edge or lateral surface **83** of the brick **18** and provides the information to a processor which calculates the position of the edge or lateral surface **83** of the brick **18** with respect to other bricks **18**. If a wider brick is approaching the saw blade **16**, then the processor controls the stepper motor **81** to push or pull the rack **64** as the case may be in order to rotate and position the fingers **14** at the proper angular position so that the tines **68** of the fingers **14** apply the proper pressure to the upcoming brick. If a narrower brick is approaching the saw blade **16**, then the process controls the stepper motor **81** to push or pull the rack as the case may be in order rotate and position the fingers **14** at the proper angular position so that the tines **68** of the fingers **14** apply the proper pressure to the upcoming brick **18**.

To further stabilize the fingers **14**, the bottom of the finger **14** may have a peg **78**. The peg **78** may be received into an alignment hole **80** at the bottom of the tube defining the mounting fixture **48**. The alignment hole **80** is formed in a block **84** that is attached (e.g., welded, bolted) to a bottom surface **82** of the tube. The alignment hole **80** is disposed immediately below the hole **50** so that the hole **50** and the alignment hole **80** vertically positions the finger **14** and the tine **68** extends flush against the side of the brick **18**.

Alternatively, the peg **78** may alternatively receive a pin **86** in the following manner. The lower surface **82** may have a threaded aperture **88**. A nut **90** having a pin **86** may be formed on the distal end of the nut **90**. Threads **92** of the nut **90** are threaded into the threaded aperture **88**. Upon doing so, the pin **86** is received into a recess **94** formed in the peg **78**. The threaded hole **88** and the pin **86** of the nut **90** vertically align with the hole **50** formed in the tube defining the mounting fixture **48**.

Referring now to FIG. **4**B, the finger **14** may be adjustable in height. In particular, additional tine(s) **68** may be stacked upon the lowest tine **68**. Additionally, each of the tines **68** may be aligned vertically to each other or may be aligned separately from each other as shown in FIGS. **4**B and **4**C. The bottom side of each of the bodies **96** may have a hex or gear **98** extending below. The hex or gear **100** may be fitted into a corresponding mating ring **102**. The angular position of each of the tines **68** about vertical axis **54** may be adjusted by disengaging (i.e., lifting up the upper body **96** to disengage the lower set of gears **100** and ring **102**) setting the angular orientation of the tine **68** by re-engaging the lower set of gears **100** and ring **102**. To lock the entire stack of bodies **96** together, a bolt **104** may extend through the upper bodies **96** and then be threaded into the lowest most body **96**. Accordingly, the fingers **14** may be used to push larger pieces of masonry against the guide **20**. When a taller finger **14** is used, then a corresponding taller guide **20** may be installed on the machine **10**.

It is also contemplated that each finger or each stack of fingers may be adjusted rotationally about its respective axis **54** separate and apart from the other fingers along the line **28**, **30**. To this end, a motor (e.g., stepper motor or servo motor) may be attached to the pinion gear **62** and be operative to rotationally adjust the finger or the stack of fingers separate and apart from the other fingers along the line **28**, **30**.

Referring now to FIG. **6**, the guide **20** is adjustable so that a distance **106** between the saw blade **16** and the guide **20** can be made larger or smaller depending on the desired width of the veneer tile **12**. To increase the distance **106**, the guide **20** may be moved further away from the saw blade **16** in the direction of arrow **108**. Conversely, to decrease the distance **106**, the guide **20** may be moved closer to the saw blade **16** in the direction of arrow **110**. To increase or decrease the distance **106**, the guide **20** may be pivotably secured to a frame **112** of the machine **10** with the linkages **116**. The guide **20** may have a face **114** which contacts the brick **18** as a conveyor traverses the brick **18** closer to the saw blade **16**. The fingers **14** push the brick **18** against the face **114** of the guide **20**. The guide **20** may be an L bracket or have an L configuration, as shown in FIG. **1**. The top side of the L bracket may be secured to the frame **112** with two or more linkages **116**. The linkages **116** rotate about the frame **112**. Also, the linkages **116** are pivotable to the top side of the guide **20**. The guide **20** can rotate about the frame **112** in relation to pivot points **118** defined by the rotatable connection between the frame **112** and the linkages **116**. The linkages **116** have the same length as the guide **20**, and more particularly the face **114** of the guide **20** maintains a parallel relationship to the saw blade **16** when the guide **20** is traversed closer to **110** or further away **108** from the saw blade **16**.

To move the face **114** of the guide **20** closer to the saw blade **16**, a handle **120** is rotated in the direction of arrow **122**. Conversely, to move the face **114** of the guide **20** further away from the saw blade **16**, the handle **120** is rotated in opposite direction, namely, in the direction of arrow **124**. The handle **120** is threadedly connected to a first fixture **126** and rotatably connected to a second fixture **128**. The first fixture **126** is fixedly connected to the frame **112** of the machine **10**. A spherical body **130** is rotatably disposed within the first fixture **26**. The handle **120** is connected to a threaded rod **132** which is threadedly engaged to a threaded hole formed in the spherical body **130**. By rotating the handle **120** in the direction of arrows **122**, **124**, the threaded rod **132** is threaded further into or further out of the spherical body **130**. The distal end of the threaded rod **132** may be rotatably connected to the top side of the guide **20** in any manner known in the art or developed in the future. By way of example and not limitation, the distal end of the threaded rod **132** may be secured to a cylinder **134**. The cylinder **134** may be pivotally connected to the top side of the guide **20**. By rotating the handle **120** in the direction of arrows **122** and **124**, the threaded rod **132** pushes the guide **20** away or closer to the first fixture **126**. This in part rotates the guide **20** about pivot point **118**. As discussed above, pivoting the guide **20** about pivot point **118** traverses the guide **20** closer to or further away from the saw blade **16**. As the handle **120** is rotated in the direction of arrows **122**, **124**, the spherical body **130** rotates within the first fixture **126** that has a corresponding spherical cavity which retains the spherical body **130** in the first fixture **126**. To lock the position of the guide **20**, a lock nut **136** may be jammed against the spherical body **130**.

Referring now to FIGS. **3**, **3**A and **7**, the motor **24** of the saw blade **16** is positioned vertically above the saw blade **16**. In particular, the motor **24** has an output shaft **138** that rotates about a rotating axis **140**. The machine **10** may have left and right saw blades **16**, as shown in FIG. **3**A. The left and right saw blades **16** may be mounted to a common spindle **26**. The spindle **26** is rotatably mounted to the frame **112** with a pair of bearings **144**. The output shaft **138** of the motor **32** and the spindle **26** both have pulleys **146**. The pulleys **146** are sized

and configured to provide the right speed and transfer of energy from the motor **32** into the saw blades **16**. A belt or other energy transmission device **148** may be wrapped around the pulleys **146** of the output shaft **138** and spindle **26** to transfer the motion of the output shaft **138** of the motor **32** to the axle **142** and ultimately to the saw blades **16**. If a vertical plane **154** is drawn intersecting the rotating axis **152** of the spindle **26**, then the motor **32** is said to be positioned vertically above the saw blade **16** if an angle X of the rotating axis **140** of the output shaft **138** to such vertical plane **154** is within ±10°, and more preferably within ±5°. Additionally, referring to FIG. **3**A, the belt **148** extends vertically upward and the pulley **146** attached to the spindle **26** is disposed at a midpoint between the two saw blades **16**. To tension the belt **148**, the motor **32** may be raised in direction of arrow **150** which is vertically upwards. In this manner, energy transfer from the motor **32** to the saw blades **16** is efficient. Moreover, the weight of the saw blades **16** and the spindle **26** helps to further tension the belt **148** and mitigate any inefficiencies. Additionally, the belt **148** may be disposed at a midpoint between the saw blades **16** so that the weight of the spindle **26** and the saw blades **16** are balanced on the belt **148**. In this manner, the transfer of energy between the motor **24** and the spindle **26** is increased.

Referring now to FIGS. **3** and **7**, a motor **156** drives both of the conveyors **34**, **36**. The motor **156** is physically connected to first and second slip clutches **158***a, b*. The slip clutch **158***a* drives the first conveyor **34**. The slip clutch **158***b* drives the second conveyor **36**. During operation of the machine **10**, bricks **18** are fed through the machine on the first and second conveyors **34**, **36** independently of each other. In certain instances, the brick **18** may become jammed between the saw blade **16** and the guide **20**. When the brick **18** becomes jammed, the brick **18** may prevent movement of the conveyor **34** or **36**. If the brick **18** prevents movement of the conveyor **34** or **36**, then the appropriate slip clutch **158***a* or **158***b* disconnects the transfer of energy from the motor **156** to the first or second conveyors **34** or **36** where the brick **18** is jammed. In this manner, when the jam occurs, the other functioning line **28** or **30** can still be utilized without significantly impacting throughput of bricks **18** through the machine **10**. The functioning line **28** or **30** can be allowed to cut the bricks **18** already on the conveyor **34** or **36**. Once all of the bricks **18** already on the conveyor **34** or **36** are cut, then the machine **10** can be shut down to clear the nonfunctioning line **28** or **30**. Referring now to FIG. **3**, the motor may impart rotational motion to the slip clutches **158***a, b* with first and second chains **160***a, b*. Additionally, the slip clutch **158***a, b* may be attached to pulleys **162***a, b* with chains **164***a, b* to rotate the conveyors **34**, **36**.

Each of the slip clutches **158***a, b* may be also adjusted to slip at the same or different rates for the purpose of controlling the speed of the respective lines **28**, **30**. By way of example and not limitation, the line **28** can cut bricks having a different hardness compared to bricks being cut on line **30**. The slip clutch for the line with the harder bricks may be provided with more slip compared to slip clutch for the line with the softer bricks. By doing so, the line with the harder bricks will run at a slower pace compared to the line with the softer bricks.

Referring now to FIGS. **8**-**10**, brick loading systems **166**, **168** and **170** are shown. More particularly, referring now to FIG. **8**, the brick loading system **166** includes a conveyor **172** that is disposed upstream of each of the conveyors **34**, **36**. The conveyor **172** allows the bricks **18** to be laid end-to-end one right behind the other. As the conveyor **34**, **36** rotates, cleats **42** which are spaced apart from each other on the conveyors **34**, **36** approach the start of the line **28**, **30**. After one of the cleats **42** advances a brick **18**, the conveyor **172** advances a brick so that the brick engages the conveyor **34**, **36** due to the weight of the brick **18**. Friction between the conveyors **34**, **36** of the brick **18** advances the brick **18** forward as the conveyor **34**, **36** rotates forward. When the fingers **14** push the brick **18** against the guide **20**, the brick **18** may slip on top of the conveyor **34**, **36** because the friction caused between the fingers **14** and guide **20** is greater than the friction between the brick and the conveyors **34**, **36** due to the weight of the brick **18**. As the brick **18** stalls, the cleats **42** approach the backside of the brick **18** and push the brick **18** forward between the fingers **14** and the guide **20** and ultimately through the saw blade **16**. The conveyor **172** may be toned to the conveyor **34**, **36** and more particularly to the cleats **42**. For example, the conveyor **172** may advance a brick **18** forward only when a sensor **174** senses a cleat **42**. As such, the intermittent forward motion of the conveyor **172** is timed to the sensing of the cleat **42**.

Referring now to FIGS. **9**A-**9**C, side, rear and top views of the brick loading system **168** are shown. In FIG. **9**C, the brick loading system **168** is disposed upstream of each of the conveyors **34**, **36**. In FIG. **9**C, bricks **18** may be laid side-by-side in a cassette **176**. The bricks **18** may extend to the left when the brick loading system **168** is used to load bricks **18** onto the line **28**. The bricks **18** may extend to the right when the brick loading system **168** is used to load bricks **18** onto line **30**. The cassette **176** may align the bricks **18** on conveyor **178**. At the appropriate time, a pusher **180** advances the brick **18** onto the conveyor **34**, **36**. The conveyor **178** intermittently advances the brick **18** in line with the conveyor **34**, **36** after the pusher **180** pushes the brick **18** onto the conveyor **34**, **36**. The pusher **180** pushes the brick **18** onto the conveyor **34**, **36** in between two cleats **42**. The cleats **42** are spaced apart from each other on the conveyor **34**, **36** at known intervals. Additionally, the speed of the conveyor **34**, **36** is also a known variable. When the sensor **174** senses the cleat **42**, the pusher **180** may push the brick **18** onto the conveyor **34**, **36** immediately or after a predetermined period of time based on the known spacings between the cleats **42** and the known speed of the conveyor **34**, **36** so that one brick **18** is placed between adjacent cleats **42**. Once the pusher **180** pushes the brick **18** onto the conveyor **34**, **36** and the arm of the pusher **180** is retracted, the conveyor **178** advances the brick **18** in the cassette **176** in line with conveyor **34**, **36**. The process is repeated for each cleat **42** that passes the sensor **174**.

Referring now to FIGS. **10**A-**10**C, side, rear and top views of the brick loading system **170** are shown. In FIG. **10**C, the brick loading system **170** is shown as being disposed upstream of each conveyor **34**, **36**. Moreover, the bricks **18** are laid side-by-side in a cassette **176**. The cassette **176** is disposed above the plane of the conveyor **34**, **36** so that one brick **18** may be disposed on a platform **186** in front of or upstream of the conveyor **34**, **36**. In particular, the cassette **176** feeds the bricks **18** into a chute **182**. The conveyor **184** intermittently advances the bricks toward the conveyor **34**, **36**. The conveyor **184** traverses the bricks **18** just enough for one brick **18** to fall through the chute **182** by way of gravity and be positioned on the platform **186**. Only one brick **18** is on the platform **186** when the pusher **180** pushes that brick onto the conveyor **34**, **36**. During operation, the pusher **180** and the conveyor **184** sync the passage of the cleats **42** past sensor **174**. In particular, the spacing between the cleats **42** is known. Also, the speed of the conveyor **34**, **36** is known. Once a sensor **174** senses a cleat **42**, the pusher **180** is timed so that the brick **18** on the platform **186** pushes the brick **18** between adjacent cleats **42**. Once the brick **18** is off of the platform **186**, the conveyor **184**

rotates just enough to allow the next brick **18** to fall through the chute **182** and onto the platform **186**. The brick loading system **170** waits until the next cleat **42** is sensed or timed by the prior cleat **42** so that the brick **18** on the platform **186** is pushed by the pusher **180** between the cleats **42**.

The masonry veneer machine **10** and the various aspects and embodiments disclosed therein related to the machine **10** have been described in relation to fabricating a brick veneer tile. However, the masonry veneer machine **10** may also be utilized to cut masonry blocks of various sizes. Accordingly, the fingers may be taller to provide even pressure against larger masonry blocks to push larger masonry blocks against the guide **20**. Moreover, it is further contemplated that other types of materials may be cut using the masonry veneer machine such as wood, plastic and polymer. For lighter materials, a hold down bar **188** (see FIGS. **12** and **13**) may be disposed above the individual blocks to hold the individual blocks down as the saw blades **16** cut into the individual blocks.

Referring now to FIGS. **12** and **13**, the hold down bar **188** may be attached to the top side of the guide **20** with bolts (not shown) fed through the slotted holes **190**. The bolts clamp the hold down bar **188** to the top side of the guide **20**. This allows the user to adjust the position of the lateral edge **192** of the hold down bar **188** so that the lateral edge **192** of the hold down bar **188** is disposed closely adjacent to the medial side of the saw blade **16**. The bricks **18** traverse through the blade **16** in the direction of arrow **194**. The blade **16** rotates in the direction of arrow **196**. As the brick **18** approaches the back half of the blade **16**, the friction between the blade **16** and the brick **18**, lifts the veneer tile **12** upward. To prevent the veneer tile **12** from lifting upward and jamming between the guide **20** and the blade **16**, the hold down bar **188** is positioned above the brick **18** and more particularly, above the veneer tile **12**. The hold down bar **188** holds the veneer tile **12** in place as the brick **18** passes through the blade **16**.

Additionally, a tube **198** is connected to the hold down bar **188**. The tube **198** delivers liquid (e.g., water) to a hole **200** in the hold down bar **188**. The hole **200** is positioned in the front half of the blade **16**, and preferably near the point where the brick **18** initially contacts the blade **16**. The liquid flows through the tube **198** in the direction of arrow **202** under pressure. The liquid is introduced on one side of the blade **16** and forces water into the cut formed by the blade **16** in the brick. Water flows in the cut and helps to reduce the frictional forces that might lift the veneer tile **12** as the veneer tile **12** passes through the rear side of the blade **16**.

The above description is given by way of example, and not limitation. Given the above disclosure, one skilled in the art could devise variations that are within the scope and spirit of the invention disclosed herein, including various ways of unloading the veneer tiles. Further, the various features of the embodiments disclosed herein can be used alone, or in varying combinations with each other and are not intended to be limited to the specific combination described herein. Thus, the scope of the claims is not to be limited by the illustrated embodiments.

What is claimed is:

1. A machine for fabricating brick veneer tiles, the machine comprising:

a conveyor for moving a brick from a loading section through a saw blade section to cut the brick to an unloading section;

a saw blade disposed above the conveyor at the saw blade section;

a guide disposed on an arbor side of the saw blade; and

a set of adjustable push fingers disposed opposite the guide with respect to the saw blade for pushing the brick toward the arbor side and against the guide during operation of the machine;

wherein each of the adjustable push fingers have a pinion gear, and the machine further comprises a rack traversable in a direction of movement of the conveyor, the rack being engaged to the pinion gears of the adjustable push fingers for rotating the adjustable push fingers by traversing the rack forward or rearward and adjusting pressure that the adjustable push fingers apply to the brick by incrementally traversing the rack forward or rearward.

2. The machine of claim **1** wherein each of the adjustable push fingers can be lifted out of engagement with the rack and rotationally repositioned to increase or decrease the pressure such adjustable push finger applies to the brick.

3. The machine of claim **1** further comprising a sensor disposed upstream of the saw blade for sensing a position of a lateral side of the brick, the sensor operative to send a signal to a stepper motor for incrementally traversing the rack forward or rearward to adjust tension of the adjustable push finger for the upcoming brick to be cut by the saw blade.

4. The machine of claim **1** further comprising an auto feeder system having:

a sensor for sensing a position of the conveyor;

an actuator for advancing the brick from the auto feeder system onto the conveyor.

5. The machine of claim **4** wherein the sensor is a mechanical sensor for sensing a cleat of the conveyor.

6. The machine of claim **4** wherein the actuator is a conveyor or solenoid.

7. The machine of claim **1** wherein the guide is rotatable closer to or further away from the saw blade for adjusting a thickness of the veneer tiles.

8. The machine of claim **1** wherein the conveyor moves in a forward direction and the saw blade rotates in a forward direction.

9. The machine of claim **1** further comprising a hold down bar attached to the guide, the hold down bar extending laterally outward so as to be disposed over the brick when the brick is pushed through the blade, the hold down bar having an opening disposed in a front half of the blade and a tube for delivering liquid to the opening for directing the liquid to the cutting area between the blade and the brick.

10. A machine for fabricating brick veneer tiles, the machine comprising:

first and second conveyors for moving bricks from loading sections through saw blade sections to cut the bricks to unloading sections;

first and second saw blades respectively disposed above the first and second conveyors at the saw blade sections;

first and second guides disposed on an arbor side of the first and second saw blades; and

first and second sets of adjustable push fingers disposed opposite the respective first and second guides with respect to the first and second saw blades for pushing the bricks toward the arbor side and against the guides during operation of the machine;

a saw blade motor vertically aligned to the arbor;

a belt attached to the arbor and the blade for transferring motion from the motor to the arbor;

wherein each of the adjustable push fingers have a pinion gear, and the machine further comprises a rack traversable in a direction of movement of the conveyor, the rack being engaged to the pinion gears of the adjustable push fingers for rotating the adjustable push fingers by traversing the rack forward or rearward and adjusting pres-

sure that the adjustable push fingers apply to the brick by incrementally traversing the rack forward or rearward.

11. The machine of claim **10** wherein an output shaft of the saw blade motor is disposed directly above the arbor.

12. The machine of claim **10** further comprising a conveyor motor, the machine further comprising first and second slip clutches respectively attached to the conveyor motor and the first and second conveyors so that the first and second conveyors continue to run even if the other conveyor is jammed.

13. The machine of claim **10** the first and second conveyors move in a forward direction and the first and second saw blades rotates in a forward direction.

14. The machine of claim **10** wherein the belt is disposed at a midpoint between the first and second saw blades.

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